REMARKS

This is in response to the outstanding Office Action, Paper No. 18, dated April 14, 2004. Claims 1 and 12 have been amended. Claims 18 through 30 have been cancelled. New Claims 31 through 33 have been added. The claims now pending in the application are 1 through 17, and 31 through 33 of which Claims 1, 12, and 31 are independent claims. Reconsideration of the application, as amended, is respectfully requested.

The Examiner rejected Claims 1 through 16 under 35 U.S.C. § 102(e) as being anticipated by Stewart. The Examiner rejected Claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Stewart in view of Weaver. Amended Claims 1 and 12 and new Claims 31 through 33 overcome these rejections.

Amended Claim 1 defines the invention as a method of making a tool for molding a part such that the tool has a channel formed therein to provide the flow of fluid for heating/cooling the molded part. The method includes providing a plurality of tool sections in an unhardened state. Each of a number of the tool sections has at least one of a groove in a surface thereof and a hole therethrough. The tool sections are assembled with surfaces thereof in facing relationship to form a tool block wherein the grooves and holes form at least one channel in the tool block. The channel is formed with at least one inlet and outlet at outer walls of the tool sections to provide the flow of fluid through the channel. The facing surfaces of the adjacent tool sections are diffusion bonded by pressing the tool sections together at an elevated temperature to form a tool block. The tool block is then machined to form a final tool shape.

Amended Claim 12 defines the invention as a method of making a tool for molding a part such that the tool has a channel formed therein to provide the flow of fluid for heating/cooling the molded part. The method includes cutting a body of tool material in an annealed state into layers with opposing surfaces. At least one of a groove in a surface thereof and a hole therethrough is formed in each of a number of the layers. The layers are assembled in facing relationship so that the grooves and holes form at least one channel in the assembled layers wherein the channel is formed with at least one inlet and outlet at outer walls of the tool sections to provide the flow

of fluid through the channel. Facing surfaces of the adjacent layers are diffusion bonded by pressing the layers together at an elevated temperature to form a tool block. The tool block is then machined to form a final tool shape.

Both amended Claims 1 and 12 define the method of the invention as including machining a tool block that has been formed from tool sections diffusion bonded together to form a final tool shape. The Stewart reference teaches cutting a weldable material into a plurality of mold zones, machining surface profiles into the mold zones, then welding the mold zones together. The Stewart reference does not teach or suggest diffusion bonding tool sections to one another to form a tool block, then machining the diffusion bonded tool block to form a final tool shape. Referring to Figs. 5A, 5B, and 5C, the Stewart reference teaches a waterjet cutter capable of cutting the zones 22 from the tooling plate material. The waterjet cutter is then capable of cutting the heating and/or cooling channels 24 and surfaces 28 from each of the zones 22. After the zones 22 have been cut by the waterjet cutter, the zones 22 may be permanently assembled by electron beam welding. The Stewart reference teaches that "the feed speed in waterjet cutting is limited by the thickness of the material and the complexity of the path." See Stewart page 19, lines 16-18. Further, the Stewart reference teaches "achieving the necessary speeds for a cost effective part could require the development of a model relating the curvature of a part with the angle of the jet and the thickness of the material at that angle." See Stewart, page 20, lines 7-10. This would tend to teach away from machining tool zones after they are fastened together, because the fastened together tool zones would be significantly thicker than the individual tool zones, and, thus, according to the Stewart reference, would be more difficult, time intensive, and costly to machine once fastened together. Therefore, the Stewart reference does not show or suggest machining a tool block that has been formed from tool sections diffusion bonded together to form a final tool shape. For at least these reasons, it is respectfully submitted that Claims 1 and 12 are allowable over the applied art. Claims 2 through 11 contain all of the limitations of Claim 1 and Claims 13 through 17 contain all of the limitations of Claim 12 and are therefore also allowable.

New Claim 31 defines the invention as a method of making a tool for molding a part including providing a plurality of tool sections in an unhardened state. Each of a number of the tool sections has a groove along a surface thereof. The tool sections are assembled with surfaces thereof in facing relationship to form a tool block wherein the grooves form at least one channel in the tool block. The channel is formed with at least one inlet and outlet at outer walls of the tool sections to provide the flow of fluid through the channel along the surfaces. The facing surfaces of the adjacent tool sections are then diffusion bonded by pressing the tool sections together at an elevated temperature.

None of the cited references discloses tool sections having a groove along a surface thereof, such that a channel is formed with at least one inlet and outlet at outer walls of the tool sections to provide the flow of fluid through the channel along the surfaces of the tool sections. In particular, the Stewart reference teaches a hole cut through the thickness of multiple mold zones by a waterjet cutter. Each hole through each of the multiple mold zones is cut in a straight path through each mold zone. The holes through each of the multiple mold zones can be angled relative to the surface profile of the mold to approximate a curved surface of the surface profile. The mold zones are then aligned and welded to one another, such that the ends of the holes are aligned to form channels through the tool block in a plane generally perpendicular to length of the mold zones. The holes form channels such that fluid flows through the mold perpendicular to the cut and reassembled surfaces of the mold zones. Therefore, Stewart does not teach a groove along a surface of tool sections, such that a channel is formed so that the flow of fluid through the channel is along the surfaces of the tool sections. Thus, Claim 31 is believed to be patentable over the cited references.

New Claims 32 and 33 depend from Claims 1 and 12, respectively, and contain limitations similar to the limitations of new Claim 31. For the reasons detailed above with respect to Claims 1, 12, and 33, it is believed that Claims 32 and 33 are patentable over the cited references.

In view of the above remarks and amendments, it is believed that pending Claims 1 through 17 and 31 through 33 are patentable over the cited references and

that the application is in condition for allowance.

Respectfully submitted,

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